



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,930	10/30/2003	Shirish Nagaraj	LUCW:0005/FLE	8232
7590	09/12/2005		EXAMINER	
Michael G. Fletcher Fletcher Yoder P.O. Box 692289 Houston, TX 77269-2289			EWART, JAMES D	
			ART UNIT	PAPER NUMBER
			2683	

DATE MAILED: 09/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/696,930	Applicant(s) NAGARAJ, SHIRISH	
	Examiner James D. Ewart	Art Unit 2683	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 8-11 and 18-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-7, 12, 13 and 15-17 is/are rejected.
- 7) ☒ Claim(s) 4 and 14 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

Application/Control Number: 10/696,930

Art Unit: 2683

Election/Restriction

1. Restriction to one of the following inventions is required under 35 U.S.C. 121 and 372:

I. Claims 1-7 and 12-17 are, drawn to a beam former, classified in class 455, subclass 562.1.

II. Claims 8-11 and 18-20 are, drawn to reception of a signal at the mobile station, classified in class 455, subclass 334.

2. The inventions are distinct, each from the other because of the following reasons:

Inventions [I] and [II] are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because down link beam forming doesn't require the reception of a signal at the mobile station.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

4. During a phone conversation with the Examiner on 08-24-2005 the Applicant, Micheal Fletcher, elected to have group 1 examined.

Application/Control Number: 10/696,930

Art Unit: 2683

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 112

6. Claim 2 recites the limitation "the plurality of common phase reference signals". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 3, 12 and 13 are rejected under 35 USC 103(a) as being unpatentable over Frank (U.S. Patent Publication No. 2004/0063468) in view of Trippett et al (U.S. Patent No. 6,130,643).

Referring to claims 1 and 12, Frank teaches a system that provides user specific beams in a fixed beam network (0004,0006 and 0014), the fixed beam network comprising a plurality of

fixed beams (Figure 1), each of the plurality of fixed beams being defined by a plurality of fixed beam transmission weighting coefficients (0016), the system comprising: a device that computes reception correlation data for a received signal (0029); and a beamformer that is adapted to determine transmission weighting coefficients to be applied to a return signal (0030), but does not teach based on the difference between the reception correlation data and the fixed beam weighting coefficients associated with at least one of the plurality of fixed beams. Trippett et al teaches based on the difference between the reception correlation data (Column 5, Line 67 and Column 9, Line 45) and the fixed beam weighting coefficients associated with at least one of the plurality of fixed beams (Column 6, Lines 4-7 and Column 9, Line 45). Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Frank with the teaching of Trippett et al of being based on the difference between the reception correlation data and the fixed beam weighting coefficients associated with at least one of the plurality of fixed beams to improve overall performance over existing systems (Column 2, Lines 49-50).

Referring to claim 3, Frank further teaches wherein the system comprises at least a portion of a cellular telephone base station (Figure 1).

Referring to claim 13, Frank further teaches comprising a device that identifies one of the plurality of fixed beams (Figure 1), but does not teach the fixed beam weighting coefficients of which are to be used in determining the transmission weighting coefficients for a return transmission. Trippett et al teaches the fixed beam weighting coefficients of which are to be used

Application/Control Number: 10/696,930

Art Unit: 2683

in determining the transmission weighting coefficients for a return transmission (Column 6, Lines 4-7 and Column 9, Line 45). Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Frank with the teaching of Trippett et al teaches the fixed beam weighting coefficients of which are to be used in determining the transmission weighting coefficients for a return transmission to improve overall performance over existing systems (Column 2, Lines 49-50).

8. Claims 2, 5 and 15 are rejected under 35 USC 103(a) as being unpatentable over Frank and Trippett et al and further in view of Yetter (U.S. Patent No. 5,045,859).

Referring to claim 2, Frank further teaches comprising a device that identifies one of the plurality of fixed beams (Figure 1), but does not teach the fixed beam weighting coefficients of which are to be used in determining the transmission weighting coefficients for a return transmission. Trippett et al teaches the fixed beam weighting coefficients of which are to be used in determining the transmission weighting coefficients for a return transmission (Column 6, Lines 4-7 and Column 9, Line 45). Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Frank with the teaching of Trippett et al teaches the fixed beam weighting coefficients of which are to be used in determining the transmission weighting coefficients for a return transmission to improve overall performance over existing systems (Column 2, Lines 49-50). Frank and Trippett et al teach the limitations of claim 2, but do not teach identifying one of the plurality of common phase reference signals. Yetter teaches identifying one of the plurality of common phase

Application/Control Number: 10/696,930

Art Unit: 2683

reference signals (Column 2, Lines 50-53). Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Frank and Trippett et al with the teaching of Yetter identifying one of the plurality of common phase reference signals to provide continuous and accurate bearing information (Column 2, Line 38).

Referring to claims 5 and 15, Frank and Trippett et al teach the limitations of claims 5 and 15, but do not teach wherein each of the fixed beams is associated with a common phase reference. Yetter teaches wherein each of the fixed beams is associated with a common phase reference (Column 2, Lines 50-53). Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Frank and Trippett et al with the teaching of Yetter wherein each of the fixed beams is associated with a common phase reference to provide continuous and accurate bearing information (Column 2, Line 38).

9. Claims 6 and 16 are rejected under 35 USC 103(a) as being unpatentable over Frank, Trippett et al and Yetter and further in view of Ylitalo (U.S. Patent Publication No. 2003/0124994).

Referring to claims 6 and 16, Frank, Trippett et al and Yetter teach the limitations of claims 6 and 16, but do not teach wherein each of the common phase references comprises a secondary common pilot channel (S-CPICH). Ylitalo teaches wherein each of the common phase references comprises a secondary common pilot channel (S-CPICH) (0019). Therefore at

Application/Control Number: 10/696,930
Art Unit: 2683

the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Frank, Trippett et al and Yetter with the teaching of Ylitalo wherein each of the common phase references comprises a secondary common pilot channel (S-CPICH) to provide an uninterrupted pilot signal covering the whole sector (0011).

10. Claims 7 and 17 are rejected under 35 USC 103(a) as being unpatentable over Frank and Trippett et al and further in view of Ylitalo (U.S. Patent Publication No. 2003/0151553).

Referring to claims 7 and 17, Frank and Trippett et al teach the limitations of claims 7 and 17, but do not teach wherein the transmission weighting coefficients may be expressed as a weighting matrix. Ylitalo teaches wherein the transmission weighting coefficients may be expressed as a weighting matrix (0064). Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Frank and Trippett et al with the teaching of Ylitalo wherein the transmission weighting coefficients may be expressed as a weighting matrix to estimate the direction of arrival for forming a downlink beam (0022).

Allowable Subject Matter

11. Claims 4 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

- Application/Control Number: 10/696,930
Art Unit: 2683

Referring to claims 4 and 14, the references cited do not teach wherein the transmission weighting coefficients are computed according the formula $v_o = 1/k W(I + j(Q_1 + \gamma I)^{-1} Q_2) X_p$.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Brunner et al. U.S. Patent Publication No. 2004/0082299 discloses method for controlling the formation of a downlink beam.

Hamalainen et al. U.S. Patent Publication No. 2004/0014499 discloses determining signal direction in radio system.

Lei et al. U.S. Patent Publication No. 2003/0190897 method for selecting switched orthogonal beams for downlink diversity transmission.

Keskitalo et al. U.S. Patent No. 6,345,188 discloses base station for phasing a transmission signal to a mobile unit based on information received from the mobile unit.

Kikuchi U.S. Patent No. 6,433,738 discloses transmission antenna directivity control apparatus and method.

Logothetis et al. U.S. Patent Publication No. 2005/0101352 discloses method and apparatus for a multi-beam antenna system.

Raghothaman et al. U.S. Patent Publication No. 2003/0162567 discloses apparatus and associated method, for selecting antenna pattern configuration to be exhibited by an antenna assembly of a communication system.

Application/Control Number: 10/696,930

Art Unit: 2683

Raleigh et al. U.S. Patent Publication No. 2004/0157646 discloses method and apparatus for adaptive transmission beam forming in a wireless communication system.

Suzuki et al. U.S. Patent Publication No. 2002/0068590 discloses wireless communication method and system using beam direction-variable antenna.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James D. Ewart whose telephone number is (571) 272-7864. The examiner can normally be reached on M-F 7am - 4pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost can be reached on (571)272-7872. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-2600.


Ewart
September 2, 2005


WILLIAM TROST
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600